

REMARKS

Status of Application

By the present Amendment, claims 17-18 have been added. Claims 1-2, 4, 6, 8-9 and 11-18 are all the claims pending in the application. Claims 1-2, 4, 6, 8-9 and 11-16 have been rejected.

Claim Rejections - 35 U.S.C. § 103

Claims 1, 2, 4, 6, 8, 9 and 11-16 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Qi (US 6774497) taken with Fujimori (US 2004/0046252 A1). Applicant respectfully traverses all of these rejections for at least the reasons set forth below.

With the previous Amendment filed on January 26, 2010, Applicant pointed out that the cited references, and any combination thereof, fail to teach or suggest that the solder resist overlaps the electrode pads in a solder mask defined structure, as claimed. In response, the Examiner maintains the rejections and alleges that FIG. 2B of Qi shows that the solder mask 250 overlaps with the substrate pads 242 in a horizontal plane (05/11/2010 Office Action, page 2). Applicant respectfully disagrees with the grounds of rejection.

First, Applicant respectfully submits that one of ordinary skill in the art would recognize that FIG. 2B of Qi shows what is generally called a non-SMD structure. Therefore, the Examiner's reliance on FIG. 2B of Qi as allegedly teaching the claimed features of wherein the solder resist overlaps the electrode pads in a solder mask defined structure, is unsupported. Contrary to the requirements of MPEP § 707.07, the grounds of rejection do not provide any substantive response whatsoever to Applicant's previous arguments that FIG. 2B of Qi shows

what is generally called a non-SMD structure¹. Thus, the previous arguments remain unrebutted and claim 1 is patentable over the cited references for at least the reasons already of record.

Second, without conceding to the merits of the Examiner's rejections, claim 1 has been amended, as set forth above, to recite (in part):

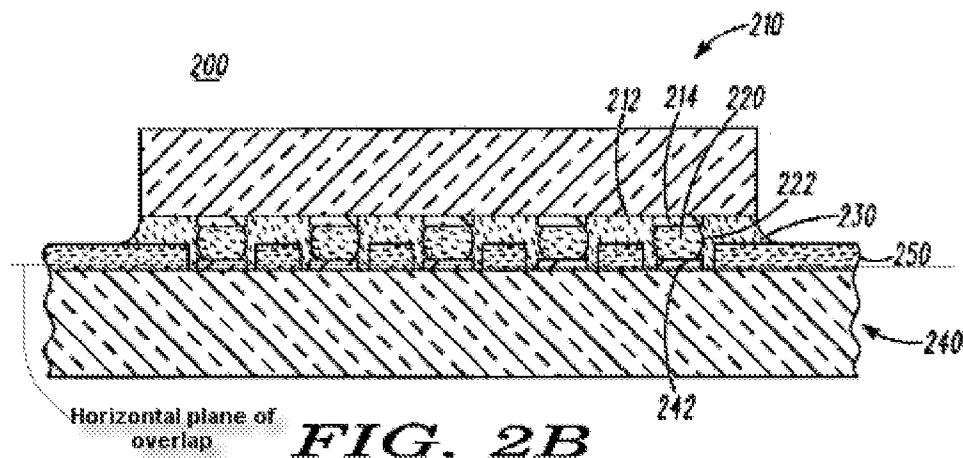
...wherein the solder resist overlaps the electrode pads in a solder mask defined structure when viewed from a direction normal to the surface of the wiring board...

Support for the above amendments is provided by at least FIG. 6 of the original specification. No new matter has been added.

Applicant respectfully submits that Qi, Fujimori, and any combination thereof, fail to teach or suggest the above features and, therefore, claim 1 is patentable over the cited references for at least these reasons.

The Examiner states that he has interpreted the claimed "overlaps" limitation to mean that the electrode pad and the solder mask share some common property or dimension. As such, the current rejections rely on the allegation that FIG. 2B of Qi shows that the solder mask 250 overlaps with the substrate pads 242 in a horizontal plane (05/11/2010 Office Action, page 2). To support such allegations, the Examiner relies on the explanatory drawing reproduced below:

¹ MPEP § 707.07(f) explicitly requires that the Examiner answer all material that has been traversed by the Applicant. MPEP § 707.07 mandates that “[t]he examiner's action will be complete as to all matters.” Moreover, MPEP §707.07(f) requires that “[w]here the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it” (emphasis added).



Applicant respectfully disagrees with the grounds of rejection. However, without conceding to the merits of the Examiner's rejections, amended claim 1 more clearly specifies that the solder resist overlaps the electrode pads in a solder mask defined structure when viewed from a direction normal to the surface of the wiring board. Further, as recited in amended claim 1, the recited "the surface of the wiring board" derives its antecedent basis from the previously recited "a wiring board in which electrode pads are formed on a surface thereof." That is, the recited "a direction normal to the surface of the wiring board," refers to a direction normal to the surface of the wiring board on which electrode pads are formed.

FIG. 2B of Qi clearly shows that the solder mask 250 does not overlap with the substrate pads 242 when viewed from a direction normal to the surface of the electrical substrate 240 on which the pads 242 are formed. Moreover, Fujimori fails to remedy the deficient teachings of Qi.

Indeed, as explained with the pages 9-10 of previous Amendment filed on January 26, 2010, with reference to an illustrative embodiment, employing an SMD structure as recited in claim 1 has several nonobvious advantages as compared with the cited references.

First, since a solder resist 7 covers the peripheral areas of an electrode pad 5, wetting of the electrode pad 5 by a bump 3 is not widely spread due to the presence of the solder resist 7. Since the peripheral areas of the electrode pad 5 are not covered by the bump 3, stress does not act on the edges of the electrode pad 5 when a semiconductor device according to the claimed subject matter is mounted. As convergence of stress on a specific area can be reduced, peeling of the electrode pad 5 and cracks on a wiring board 1 can be prevented. Thus, a semiconductor device consistent with claim 1 affords high connection reliability.

Secondly, when a plurality of the electrode pads 5 are connected with each other by wires, the solder resist 7 entirely covers the wires, including connection portions between the electrode pads and the wires, in the SMD structure. As the wires are highly protected, the connection reliability is high consistent with an illustrative embodiment of claim 1.

Since Qi, Fujimori, and any combination thereof, fail to teach or suggest all the features of claim 1, Applicant respectfully submits that claim 1 is patentable over the cited references for at least these reasons.

In view of the similarity between the recitations of amended claim 6 and the recitations discussed above regarding claim 1, Applicant respectfully submits that claim 6 is patentable over the cited references for at least reasons similar to those already discussed above.

Finally, Applicant respectfully submits that the dependent claims 2, 4, 8, 9 and 11-16 are patentable at least by virtue of their dependencies on claims 1 and 6, respectively.

New Claims

By the present Amendment, new claims 18-19 have been added and are fully supported by at least FIGS. 2 and 6A-6C of the original specification. No new matter has been added.

Applicant respectfully submits that new claims 18-19 are patentable over the cited references at least by virtue of there their dependencies on claims 1 and 6, respectively, as well as the additionally recited features therein.

Thus, the allowance of claims 18-19 is respectfully requested.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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23373
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Date: August 11, 2010